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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,522	03/21/2001	Kenneth E. Madsen	1109.003CIP	3556
30636	7590	02/10/2005	EXAMINER	
FAY KAPLUN & MARCIN, LLP 150 BROADWAY, SUITE 702 NEW YORK, NY 10038			NAHAR, QAMRUN	
			ART UNIT	PAPER NUMBER
			2124	
DATE MAILED: 02/10/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/813,522	Applicant(s) MADSEN ET AL.	
	Examiner Qamrun Nahar	Art Unit 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed on 8/30/04.
2. The rejection under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention to claims 27-31 and 33-39 is withdrawn in view of applicant's amendment.
3. The rejection under 35 U.S.C. 102(e) as being anticipated by Smolders (U.S. 6,223,338) to claims 1-9, 11-15, 18-19, 22-44, 46, 48 and 49 is moot in view of the new ground(s) of rejection.
4. The rejection under 35 U.S.C. 103(a) as being unpatentable over Smolders (U.S. 6,223,338) in view of Davidson (U.S. 5,664,191) to claims 20-21, 45 and 47 is moot in view of the new ground(s) of rejection.
5. Claims 1, 27, 33 and 45-49 have been amended.
6. Claims 1-49 are pending.
7. Claims 1-49 stand finally rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claims 1-9, 11-15, 18-19, 22-44, 46, 48 and 49 stand finally rejected under 35 U.S.C. 102(b) as being anticipated by Heisch (U.S. 5,689,712).
9. Claims 20-21, 45 and 47 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Heisch (U.S. 5,689,712) in view of Davidson (U.S. 5,664,191).
10. Claims 10, 16 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations

Art Unit: 2124

of the base claim and any intervening claims (See the previous Office Action, Mailed on 04/29/2004, par. 10 and 11).

Response to Amendment

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 45-49 recites the limitation "changing **the** behavior of **the** run time" in line 2 of the claims. There is insufficient antecedent basis for this limitation in the claim. Therefore, this limitation is interpreted as "changing **a** behavior of **a** run time"

Claims 2-44 are rejected for dependency upon rejected base claim 1 above.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-9, 11-15, 18-19, 22-44, 46, 48 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Heisch (U.S. 5,689,712).

Per Claim 1 (Amended, as best understood):

The Heisch patent discloses:

- **a method for monitoring data and changing a behavior of a run time execution of software code in a target system (column 2, lines 23-33)**
- **(a) searching a range of addresses within the software code to identify a desired instruction (column 4, lines 5-14)**
- **(b) replacing the desired instruction with a program flow change instruction directing execution to a buffer, wherein the program flow change instruction is configured to change the behavior, relative to that of the desired instruction, of the run time execution of the software code; and (c) inserting a routine into the buffer, the routine having an output instruction and a branch instruction branching to an address of the software code subsequent to the program flow change instruction (column 4, lines 9-29 and lines 35-45).**

Per Claim 2 (as best understood):

The Heisch patent discloses:

- **wherein the output instruction generates output to a trace buffer (column 4, lines 58-62).**

Per Claim 3 (as best understood):

The Heisch patent discloses:

- wherein the trace buffer is disposed on the target system (column 4, lines 58-62).

Per Claim 4 (as best understood):

The Heisch patent discloses:

- comprising (e) storing information in an instrumentation table to undo said replacing (b) and said inserting (c) (column 3, lines 62-67 to column 4, lines 1-4).

Per Claim 5 (as best understood):

The Heisch patent discloses:

- wherein the instrumentation table is disposed on a host system communicably coupled to the target system (column 3, lines 62-67 to column 4, lines 1-4).

Per Claim 6 (as best understood):

The Heisch patent discloses:

- wherein said storing (e) comprises storing the desired instruction, address of the desired instruction, action to be performed by the program flow change instruction, address of the

Art Unit: 2124

buffer, size of the routine, and an identifier associated with the action to be performed
(column 4, lines 30-45).

Per Claim 7 (as best understood):

The Heisch patent discloses:

- wherein the target system includes a cache and at least a portion of the software code
executes externally of the cache (column 3, lines 47-51).

Per Claim 8 (as best understood):

The Heisch patent discloses:

- wherein the target system includes a bus and at least a portion of the software code
executes on the bus (column 3, lines 15-29).

Per Claim 9 (as best understood):

The Heisch patent discloses:

- wherein said searching (a) further comprises searching for a plurality of desired
instructions (column 4, lines 5-13).

Per Claim 11 (as best understood):

Art Unit: 2124

The Heisch patent discloses:

- wherein said searching (a) comprises searching for a desired instruction disposed at the beginning of a program function (column 4, lines 5-13).

Per Claim 12 (as best understood):

The Heisch patent discloses:

- wherein the desired instruction comprises a Move From Special Register instruction (column 4, lines 21-29).

Per Claim 13 (as best understood):

The Heisch patent discloses:

- wherein said searching (a) comprises searching for an other desired instruction disposed at the ending of a program function (column 4, lines 21-29).

Per Claim 14 (as best understood):

The Heisch patent discloses:

- wherein the other desired instruction comprises a Move To Special Register instruction (column 4, lines 21-29).

Per Claim 15 (as best understood):

The Heisch patent discloses:

- wherein said searching (a) comprises searching for at least one desired instruction associated with data manipulation (column 4, lines 21-29).

Per Claim 18 (as best understood):

The Heisch patent discloses:

- wherein said searching (a) comprises searching for a branch instruction, and searching for the desired instruction in a portion of the software code indicated by the branch instruction, the desired instruction being disposed outside of the range of addresses identified (column 4, lines 5-13).

Per Claim 19 (as best understood):

The Heisch patent discloses:

- wherein the desired instruction comprises an EABI instruction (column 4, lines 5-13).

Per Claim 22 (as best understood):

The Heisch patent discloses:

Art Unit: 2124

- wherein the program flow change instruction comprises an instruction to read from an odd address (column 4, lines 5-13).

Per Claim 23 (as best understood):

The Heisch patent discloses:

- wherein the program flow change instruction comprises an instruction to add an odd integer to an address (column 4, lines 5-13).

Per Claim 24 (as best understood):

The Heisch patent discloses:

- wherein the routine has a decoding instruction to identify the odd integer and execute an instruction corresponding thereto (column 4, lines 37-45).

Per Claim 25 (as best understood):

The Heisch patent discloses:

- comprising a plurality of program flow change instructions corresponding to a plurality of user-selectable operations (column 4, lines 5-29).

Per Claim 26 (as best understood):

The Heisch patent discloses:

- wherein each of said plurality of user-selectable operations is selected from the group consisting of: indicating entry and exit of a function; indicating entry and exit of a function and tracing execution of a function; indicating entry and exit of a function, tracing execution of the function, and indicating entry and exit and tracing execution of other functions called by the function; indicating Entry and Exit of a function, tracing execution of the function, and indicating Entry and Exit without tracing execution of other functions called by the function; indicating data manipulation; inserting patch code into a code portion; indicating the sequence of program execution; and indicating changes to variables (column 4, lines 5-29).

Per Claim 27 (Amended, as best understood):

The Heisch patent discloses:

- wherein said inserting (c) comprises: (i) selecting at least one output code statement to perform a selected one of said user-selectable operations; (ii) saving a copy of the output code statement and the desired instruction; (iii) determining the size of the output code statement, the branch instruction, the desired instruction, and restore code to restore the desired instruction; and (iv) allocating memory in the buffer of the size determined in (iii);

Art Unit: 2124

and (v), inserting the output code statement, the branch instruction, the desired instruction, and restore code, into the allocated memory (column 4, lines 30-45).

Per Claim 28 (as best understood):

The Heisch patent discloses:

- wherein said saving (ii) comprises saving a copy of the program flow change instruction and the desired instruction in a translation table (column 4, lines 30-45).

Per Claim 29 (as best understood):

The Heisch patent discloses:

- wherein said selecting (i) comprises analyzing a symbol table of the software code (column 3, lines 47-51).

Per Claim 30 (as best understood):

The Heisch patent discloses:

- wherein said selecting (i) comprises calling a function selected from the group consisting of a printf or scanf function (column 3, lines 47-51).

Per Claim 31 (as best understood):

The Heisch patent discloses:

- wherein the restore code comprises code to save and restore original register contexts (column 4, lines 30-45).

Per Claim 32 (as best understood):

The Heisch patent discloses:

- wherein said searching (a) comprises identifying addresses in the program code that are associated with each instance of a modification of an identified variable/structure, and locating a final instruction for each instance of a modification, the final instruction being said desired instruction (column 4, lines 5-13).

Per Claim 33 (Amended, as best understood):

The Heisch patent discloses:

- wherein said inserting (c) comprises: (i) selecting at least one output code statement to transfer data to the buffer; (ii) saving a copy of the output code statement and the desired instruction; (iii) determining the size of the output code statement, the desired instruction, and restore code to restore the desired instruction; (iv) allocating memory in the buffer of the size determined in (iii), and to run the trace acquisition code; (v) inserting the output

Art Unit: 2124

code statement, the branch instruction, the desired instruction, and restore code, into the allocated memory (column 4, lines 21-29).

Per Claim 34 (as best understood):

The Heisch patent discloses:

- wherein said allocating (iv) further comprises allocating additional memory of the size determined in (iii) for each said instance of a modification of an identified variable/structure (column 4, lines 21-29).

Per Claim 35 (as best understood):

The Heisch patent discloses:

- further comprising repeating said inserting (v) for each said instance (column 4, lines 21-29).

Per Claim 36 (as best understood):

The Heisch patent discloses:

- wherein said saving (ii) comprises saving a copy of the program flow change instruction and the desired instruction in a translation table (column 4, lines 37-45).

Per Claim 37 (as best understood):

The Heisch patent discloses:

- wherein said selecting (i) comprises analyzing a symbol table of the software code (column 3, lines 47-51).

Per Claim 38 (as best understood):

The Heisch patent discloses:

- wherein said selecting (i) comprises calling a function selected from the group consisting of a printf or scanf function (column 3, lines 47-51).

Per Claim 39 (as best understood):

The Heisch patent discloses:

- wherein the restore code comprises code to save and restore original register contexts (column 4, lines 30-45).

Per Claim 40 (as best understood):

The Heisch patent discloses:

Art Unit: 2124

- further comprising reversing said replacing (b), and inserting (c), to restore the software code (column 4, lines 30-45).

Per Claim 41 (as best understood):

The Heisch patent discloses:

- wherein at least one of said searching (a), replacing (b), and inserting (c), is performed during run time execution of the software code (column 4, lines 30-45).

Per Claim 42 (as best understood):

The Heisch patent discloses:

- wherein at least one of said searching (a), replacing (b), and inserting (c), is performed after the software code is compiled (column 4, lines 30-45).

Per Claim 43 (as best understood):

The Heisch patent discloses:

- wherein execution of the software code is halted during performance of said at least one of said searching (a), replacing (b), and inserting (c) (column 4, lines 30-45).

Per Claim 44 (as best understood):

The Heisch patent discloses:

- **comprising executing the software code** (column 4, lines 30-45).

Per Claim 46 (Amended, as best understood):

This is a system version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above.

Thus, accordingly, this claim is also anticipated by Heisch.

Per Claim 48 (Amended, as best understood):

This is an article of manufacture version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Heisch.

Per Claim 49 (Amended, as best understood):

This is a computer readable program code version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Heisch.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2124

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 20-21, 45 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heisch (U.S. 5,689,712) in view of Davidson (U.S. 5,664,191).

Per Claim 20 (as best understood):

The rejection of claim 1 is incorporated, and further, Heisch does not explicitly teach wherein the searching (a) comprises using debug information to identify the desired instruction. Davidson teaches wherein the searching (a) comprises using debug information to identify the desired instruction (column 2, lines 46-50).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Heisch to include wherein the searching (a) comprises using debug information to identify the desired instruction using the teaching of Davidson. The modification would be obvious because one of ordinary skill in the art would be motivated to identify basic blocks more efficiently.

Per Claim 21 (as best understood):

The rejection of claim 20 is incorporated, and Davidson further teaches wherein the searching (a) comprises using compiler-derived debug information in a format selected from the group consisting of stabs, elf, and dwarf formats (column 5, lines 22-27).

Per Claim 45 (Amended, as best understood):

Art Unit: 2124

This is another version of the claimed method discussed above (claims 1 and 20), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 47 (Amended, as best understood):

This is a system version of the claimed method discussed above (claims 1 and 20), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Allowable Subject Matter

17. Claims 10, 16 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims (See the previous Office Action, Mailed on 04/29/2004, par. 10 and 11).

Response to Arguments

18. Applicant's arguments with respect to claims 1-9, 11-15 and 18-49 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (571) 272-3730. The examiner can normally be reached on Mondays through Thursdays from 8:30 AM to 6:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (571) 272-3719. The fax phone number for the organization where this application or processing is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Art Unit: 2124

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QN
January 24, 2005

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